

# Confidence Interval & Confidence Sets

1. Define: (i) Confidence Interval, (ii) Length of the Confidence Interval, (iii) Shortest length of the Confidence Interval.
2. Define Confidence Sets. What are the types of Confidence Sets? Explain them very briefly.
3. What are the methods of constructing Confidence Sets? By inverting a normal test, explain the method of “Inverting a test statistics”.
4. Explain the pivotal quantity along with an example.
5. Let  $X \sim N(\mu, \sigma^2)$ . Find the shortest length confidence interval for  $\mu$  by using pivotal quantity when,
  - (i)  $\sigma^2$  is known
  - (ii)  $\sigma^2$  is unknown
6. Let  $X \sim P(\theta)$  i.e.  $f(x; \theta) = \frac{e^{-\theta} \theta^x}{x!}$ ;  $x = 0, 1, 2, \dots, \infty$ . Find a  $100(1 - \alpha)\%$  large sample C.I for  $\theta$  by using pivotal quantity.
7. Write down the properties of Confidence Sets. Distinguish between Confidence Sets and Confidence Interval. Illustrate the correspondance between Confidence Sets and Tests.
8. Define Simultaneous Confidence Interval. What are the methods of constructing Simultaneous Confidence Interval. Explain one of them.
9. Define Confidence Bands for Cumulative Distribution Functions with at least two examples.